

# **WVR720UP, WVR820UP, and WVR830UP Upgrades for the WVR7200, WVR8200, and WVR8300 Waveform Rasterizers**

## **Instructions**

### **Warning**

The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries prior to performing service.

[www.tektronix.com](http://www.tektronix.com)



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- In North America, call 1-800-833-9200.
- Worldwide, visit [www.tektronix.com](http://www.tektronix.com) to find contacts in your area.

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## Important safety information

This manual contains information and warnings that must be followed by the user for safe operation and to keep the product in a safe condition.

To safely perform service on this product, additional information is provided at the end of this section. (See page 3, *Service safety summary*.)

### General safety summary

Use the product only as specified. Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. Carefully read all instructions. Retain these instructions for future reference.

Comply with local and national safety codes.

For correct and safe operation of the product, it is essential that you follow generally accepted safety procedures in addition to the safety precautions specified in this manual.

The product is designed to be used by trained personnel only.

Only qualified personnel who are aware of the hazards involved should remove the cover for repair, maintenance, or adjustment.

Before use, always check the product with a known source to be sure it is operating correctly.

This product is not intended for detection of hazardous voltages.

Use personal protective equipment to prevent shock and arc blast injury where hazardous live conductors are exposed.

While using this product, you may need to access other parts of a larger system. Read the safety sections of the other component manuals for warnings and cautions related to operating the system.

When incorporating this equipment into a system, the safety of that system is the responsibility of the assembler of the system.

**To avoid fire or personal injury**

**Use proper power cord.** Use only the power cord specified for this product and certified for the country of use.

Do not use the provided power cord for other products.

**Ground the product.** This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, make sure that the product is properly grounded.

**Power disconnect.** The power cord disconnects the product from the power source. See instructions for the location. Do not position the equipment so that it is difficult to operate the power cord; it must remain accessible to the user at all times to allow for quick disconnection if needed.

**Observe all terminal ratings.** To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Do not apply a potential to any terminal, including the common terminal, that exceeds the maximum rating of that terminal.

**Do not operate without covers.** Do not operate this product with covers or panels removed, or with the case open. Hazardous voltage exposure is possible.

**Avoid exposed circuitry.** Do not touch exposed connections and components when power is present.

**Do not operate with suspected failures.** If you suspect that there is damage to this product, have it inspected by qualified service personnel.

Disable the product if it is damaged. Do not use the product if it is damaged or operates incorrectly. If in doubt about safety of the product, turn it off and disconnect the power cord. Clearly mark the product to prevent its further operation.

Before use, inspect voltage probes, test leads, and accessories for mechanical damage and replace when damaged. Do not use probes or test leads if they are damaged, if there is exposed metal, or if a wear indicator shows.

Examine the exterior of the product before you use it. Look for cracks or missing pieces.

Use only specified replacement parts.

**Do not operate in wet/damp conditions.** Be aware that condensation may occur if a unit is moved from a cold to a warm environment.

**Do not operate in an explosive atmosphere.**

**Keep product surfaces clean and dry.** Remove the input signals before you clean the product.

**Provide proper ventilation.** Refer to the installation instructions in the manual for details on installing the product so it has proper ventilation.

Slots and openings are provided for ventilation and should never be covered or otherwise obstructed. Do not push objects into any of the openings.

**Provide a safe working environment.** Always place the product in a location convenient for viewing the display and indicators.

Avoid improper or prolonged use of keyboards, pointers, and button pads.

Be sure your work area meets applicable ergonomic standards. Consult with an ergonomics professional to avoid stress injuries.

Use care when lifting and carrying the product.

Use only the Tektronix rackmount hardware specified for this product.

## Service safety summary

The *Service safety summary* section contains additional information required to safely perform service on the product. Only qualified personnel should perform service procedures. Read this *Service safety summary* and the *General safety summary* before performing any service procedures.

**To avoid electric shock.** Do not touch exposed connections.

**Do not service alone.** Do not perform internal service or adjustments of this product unless another person capable of rendering first aid and resuscitation is present.

**Disconnect power.** To avoid electric shock, switch off the product power and disconnect the power cord from the mains power before removing any covers or panels, or opening the case for servicing.

**Use care when servicing with power on.** Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

**Verify safety after repair.** Always recheck ground continuity and mains dielectric strength after performing a repair.

## Terms in this manual

These terms may appear in this manual:



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**WARNING.** *Warning statements identify conditions or practices that could result in injury or loss of life.*

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**CAUTION.** *Caution statements identify conditions or practices that could result in damage to this product or other property.*

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## Symbols and terms on the product

These terms may appear on the product:

- DANGER indicates an injury hazard immediately accessible as you read the marking.
- WARNING indicates an injury hazard not immediately accessible as you read the marking.
- CAUTION indicates a hazard to property including the product.



When this symbol is marked on the product, be sure to consult the manual to find out the nature of the potential hazards and any actions which have to be taken to avoid them. (This symbol may also be used to refer the user to ratings in the manual.)

The following symbol(s) may appear on the product:



CAUTION  
Refer to Manual



Protective Ground  
(Earth) Terminal



Standby

## Kit description

This document provides instructions for installing the video, audio, and analysis upgrades listed in the following tables into an existing Tektronix WVR7200, WVR8200, or WVR8300 waveform rasterizer.

**Table 1: Supported video upgrades**

Video upgrades	WVR820UP	WVR830UP	WVR720UP	Description
Option 2SDI	✓	✓	✓	Adds a second SDI input module, adding 2 additional SDI inputs that support 3G-SDI, HD-SDI, and SD-SDI. (Option 3G is required for 3G-SDI support).
Option 3G	✓	✓	✓	Adds support for 3G-SDI signal formats.
Option 4K	✓	✓		Adds support for UHDTV1/4K signal formats. (requires Options 3G and 2SDI)
Option CPS	✓	✓	✓	Adds support for Composite Analog Video Monitoring; 2 composite Analog inputs; passive loop-through. This option not compatible with Option 2SDI.
Option 3D	✓			Adds Stereoscopic 3-D Video Monitoring Capabilities (including Simultaneous Input Monitoring (SIM) of dual SDI inputs and synchronized left eye and right eye signals monitoring (SyncVu™)).
Option S3D			✓	Adds Stereoscopic 3-D Video Monitoring Capabilities (including Simultaneous Input Monitoring (SIM) of dual SDI inputs and synchronized left eye and right eye signals monitoring (SyncVu™)).
Option GEN	✓		✓	Adds color bar and pathological signal generator for SD/HD SDI. Option 3G required for 3G-SDI support.
Option AVD	✓		✓	Add support for out-of-service audio/video delay measurement; requires Option AD or DPE.
Option SIM	✓		✓	Adds simultaneous monitoring of 2 HD/SD-SDI inputs or one HD/SD-SDI input and one CPS input; Option 3G required for 3G-SDI formats support.

**Table 2: Supported audio upgrades**

Audio upgrades	WVR820UP	WVR830UP	WVR720UP	Description
Option AD	✓	✓	✓	Adds Analog Audio Monitoring (2 sets of 6 channel Analog Audio inputs and 8 channels of Analog Audio outputs); 16 channels Embedded and AES/EBU Digital Audio support (8 channels at a time).
Option DPE	✓	✓	✓	Adds Option AD capabilities (Analog and Digital Audio, Embedded or External AES), plus support for decoding and monitoring Dolby E, Dolby D, and Dolby Digital Plus Audio. (Audio cable available separately).

**Table 3: Supported analysis upgrades**

Analysis upgrades	WVR820UP	WVR830UP	WVR720UP	Description
Option EYE	✓			Adds Eye Pattern Display and Jitter Measurement Package (includes 3G-SDI, HD-SDI, and SD-SDI Eye pattern and Jitter waveform displays; automated measurements of Eye pattern parameters, Jitter, and cable parameters; color bar and pathological signal generation); Option 3G required for 3G-SDI support.
Option PHY		✓		Adds Physical Layer Measurement Package (includes 3G-SDI, HD-SDI, and SD-SDI Eye pattern and jitter waveform displays; automated measurements of Eye pattern parameters, jitter, and cable parameters; color bar and pathological signal generation); Option 3G required for 3G-SDI support.
Option PHY3			✓	Adds Physical Layer Measurement Package (includes 3G-SDI, HD-SDI, and SD-SDI Eye pattern and jitter waveform displays; automated measurements of Eye pattern parameters, jitter, and cable parameters; Option 3G required for 3G-SDI support.
Option PROD	✓	✓	✓	Adds Advanced Gamut Monitoring Package (Spearhead Display and Luma Qualified Vector Display).
Option DAT	✓		✓	Adds data analysis capabilities. Allows for logic-level view of video and embedded audio data stream and ANC data extraction.

## Products

The following Tektronix products are supported by this kit:

**WVR7200** (all instruments)

**WVR8200** (all instruments)

**WVR8300** (all instruments)

## Required tools

The following table lists the tools required to install the upgrade.

**Table 4: Required tools**

Name	Description
TORX screwdriver handle (Hardware options only)	Accepts TORX-driver bits
T-10 and T-15 TORX tips (Hardware options only)	TORX-driver bit for T-10 and T-15 screw heads
9/16 inch socket (Hardware options only)	Deep socket to fit over BNC connector.
3/16 inch socket (Hardware options only)	Socket to fit over audio connector posts.
1/4 inch socket (Hardware options only)	Socket to fit over circuit board posts.
XGA Monitor	
Standard PC	Running Windows XP or Windows 7
Anti-static wrist strap (Hardware options only)	
For WVR8000 Series upgrades, <i>WVR8200 and WVR8300 Specifications and Performance Verification</i> manual and all test equipment listed within to perform the verification checks.	Tektronix part number 077-0260-XX. Available for download from the Tektronix Web site at <a href="http://www.tektronix.com/manuals">www.tektronix.com/manuals</a> .
For WVR7200 upgrades, <i>WVR7200 Specifications and Performance Verification</i> manual and all test equipment listed within to perform the verification checks	Tektronix part number 077-0670-XX Available for download from the Tektronix Web site at <a href="http://www.tektronix.com/manuals">www.tektronix.com/manuals</a>

## Kit parts lists

The following tables list the parts supplied with each upgrade kit. Before you start the upgrade, verify that you received all of the parts for the upgrade kit you ordered.

WVR820UP 2SDI  
WVR830UP 2SDI  
WVR720UP 2SDI

**Table 5: Option 2SDI parts list**

Quantity	Part number	Description
1 EA	—	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-1016-XX	INSTRUCTIONS; WVR720UP, WVR820UP, AND WVR830UP UPGRADES (this document)
1 EA	870-0195-XX	CIRCUIT BOARD SUBASSY;WVR SDI,TESTED
3 EA	211-1272-XX	SCREW, MACHINE; 6-32 X 0.250, PNH, STL, ZNPL, T-15 TORX DR
1 EA	335-2393-XX	LABEL REAR PANEL, SDI

**NOTE.** Once the hardware is installed, you must download the software to activate Option 2SDI. Go to [www.tektronix.com/downloads](http://www.tektronix.com/downloads). (See page 14, Install software upgrade.)

WVR820UP CPS  
WVR830UP CPS  
WVR720UP CPS

**Table 6: Option CPS parts list**

Quantity	Part number	Description
1 EA	—	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-1016-XX	INSTRUCTIONS; WVR720UP, WVR820UP, AND WVR830UP UPGRADES
1 EA	870-0194-XX	CIRCUIT BD SUBASSY; ANALOG COMPOSITE
3 EA	211-0722-XX	SCREW, MACHINE; 6-32 X 0.250, PNH, STEEL, ZINC FINISH, T-15 TORX DR
4 EA	220-0497-XX	NUT, PLAIN, HEX; .5-28 X .562 HEX, BRS, NI (NICKEL) PLATED
4 EA	210-1039-XX	WASHER, LOCK; 0.521 ID, INT, 0.025 THK, STEEL, ZINC FINISH
1 EA	335-2392-XX	LABEL REAR PANEL, COMPOSIT

**WVR820UP EYE** Table 7: Option EYE parts list

Quantity	Part number	Description
1 EA	—	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-1016-XX	INSTRUCTIONS; WVR720UP, WVR820UP, AND WVR830UP UPGRADES
1 EA	872-0189-XX	CIRCUIT BOARD SUBASSY; 3G-EYE
6 EA	211-0722-XX	SCREW, MACHINE; 6-32 X 0.250, PNH, STEEL, ZINC FINISH, T-15 TORX DR
4 EA	220-0497-XX	NUT, PLAIN, HEX; .5-28 X .562 HEX, BRS, NI (NICKEL) PLATED
4 EA	210-1039-XX	WASHER, LOCK; 0.521 ID, INT, 0.025 THK, STEEL, ZINC FINISH
1 EA	335-2394-XX	LABEL REAR PANEL, EYE, SDI CLOCK OUT

**WVR830UP PHY**  
**WVR720UP PHY3** Table 8: Option PHY and PHY3 parts list

Quantity	Part number	Description
1 EA	—	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-1016-XX	INSTRUCTIONS; WVR720UP, WVR820UP, AND WVR830UP UPGRADES
1 EA	872-0189-XX	CIRCUIT BOARD SUBASSY; 3G-EYE
6 EA	211-0722-XX	SCREW, MACHINE; 6-32 X 0.250, PNH, STEEL, ZINC FINISH, T-15 TORX DR
4 EA	220-0497-XX	NUT, PLAIN, HEX; .5-28 X .562 HEX, BRS, NI (NICKEL) PLATED
4 EA	210-1039-XX	WASHER, LOCK; 0.521 ID, INT, 0.025 THK, STEEL, ZINC FINISH
1 EA	335-2394-XX	LABEL REAR PANEL, EYE, SDI CLOCK OUT

**WVR820UP 3G**  
**WVR830UP 3G**  
**WVR720UP 3G**  
**WVR820UP 4K**  
**WVR830UP 4K**  
**WVR820UP PROD**  
**WVR830UP PROD**  
**WVR720UP PROD**  
**WVR820UP 3D**  
**WVR720UP S3D**  
**WVR720UP DAT**  
**WVR720UP SIM**  
**WVR720UP AVD**  
**WVR720UP GEN**  
**WVR820UP GEN**

These are SW only upgrades. No hardware is needed for these upgrades.

**Table 9: SW option upgrades parts list**

Quantity	Part number	Description
1 EA	—	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-1016-XX	INSTRUCTIONS; WVR720UP, WVR820UP, AND WVR830UP UPGRADES

**WVR820UP AD**  
**WVR830UP AD**  
**WVR720UP AD**

**Table 10: Option AD parts list**

Quantity	Part number	Description
1 EA	—	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-1016-XX	INSTRUCTIONS; WVR720UP, WVR820UP AND WVR830UP UPGRADES
1 EA	671-9938-XX	CIRCUIT BD SUBASSY; DIGITAL AND ANALOG AUDIO
3 EA	129-1570-XX	POST, SPACER; 1.385 X 0.250 X 0.375 DEEP
3 EA	211-0722-XX	SCREW, MACHINE; 6-32 X 0.250, PNH, STEEL, ZINC FINISH, T-15 TORX DR
8 EA	220-0497-XX	NUT, PLAIN, HEX; .5-28 X .562 HEX, BRS, NI (NICKEL) PLATED
8 EA	210-1039-XX	WASHER, LOCK; 0.521 ID, INT, 0.025 THK, STEEL, ZINC FINISH
1 EA	174-5696-XX	CABLE ASSEMBLY, 100 TO 80 POSITION, MAIN TO AUDIO PCB
2 EA	214-3903-XX	SCREW, JACK; 4-40 X 0.312 LONG, 0.188 H HEX HEAD STAND OFF, 4-40 INT THD, X 0.312 THD EXT 4-40, STEEL, ZINC PLATED
1 EA	131-7430-XX	CONN,DSUB; SLDR CUP,MALE,STR,62 POS,0.100 CTR,30 GOLD
1 EA	200-4804-XX	COVER; SHIELD,ELEC CONN,37 POS DSUB,ZINC

WVR820UP DPE  
WVR830UP DPE  
WVR720UP DPE

Table 11: Option DPE parts list

Quantity	Part number	Description
1 EA	—	ENVELOPE, IMPORTANT DOCUMENTS; CONTAINS SOFTWARE OPTION KEY
1 EA	075-1016-XX	INSTRUCTIONS; WVR720UP, WVR820UP, AND WVR830UP UPGRADES
1 EA	119-7167-XX	CIRCUIT BD SUB ASSY
1 EA	119-7167-XX	CIRCUIT BD ASSY; CAT552 DOLBY E/DIGITAL DECODER MODULE; 72 PIN SIMM; SAFETY CONTROLLED
3 EA	129-1570-XX	POST, SPACER; 1.385 X 0.250 X 0.375 DEEP
3 EA	211-0722-XX	SCREW, MACHINE; 6-32 X 0.250, PNH, STEEL, ZINC FINISH, T-15 TORX DR
8 EA	220-0497-XX	NUT, PLAIN, HEX; .5-28 X .562 HEX, BRS, NI (NICKEL) PLATED
8 EA	210-1039-XX	WASHER, LOCK; 0.521 ID, INT, 0.025 THK, STEEL, ZINC FINISH
1 EA	174-5696-XX	CABLE ASSEMBLY, 100 TO 80 POSITION, MAIN TO AUDIO PCB
2 EA	214-3903-XX	SCREW, JACK; 4-40 X 0.312 LONG, 0.188 H HEX HEAD STAND OFF, 4-40 INT THD, X 0.312 THD EXT 4-40, STEEL, ZINC PLATED
1 EA	131-7430-XX	CONN,DSUB; SLDR CUP,MALE,STR,62 POS,0.100 CTR,30 GOLD
1 EA	200-4804-XX	COVER; SHIELD,ELEC CONN,37 POS DSUB,ZINC

# Upgrade installation

This section provides instructions for the following:

- Verifying the currently installed options
- Preventing electrostatic discharge
- Installing the software upgrade
- Installing the hardware upgrade
- Installing the software option key

## Verify the currently installed options

The software option key supplied in this kit is based on the serial number you supplied when you ordered the upgrade for the instrument. The new software option key enables the new option(s) you ordered and also preserves your previously purchased options.

Before you install the upgrade, perform the following steps to verify which options are currently installed in your instrument. After you install the upgrade, you will verify that the new options are installed and that any previously installed options are still enabled.

1. Power on the instrument you are upgrading.
2. Press the **CONFIG** button on the front panel.
3. Navigate to **Utilities > View Instrument Options**.
4. Make a list of the installed options.

### List installed options


## How to prevent electrostatic discharge

When you perform any service that requires internal access to the instrument, adhere to the following precautions to avoid damage due to electrostatic discharge (ESD):

1. Minimize handling of static-sensitive circuit boards and components.
2. Transport and store static-sensitive boards or modules in static protected containers.
3. Discharge the static voltage from your body by wearing a grounded antistatic wrist strap while handling these modules.
4. Service static-sensitive modules only at a static-free work station.
5. Do not allow anything capable of generating or holding a static charge on the work surface.
6. Handle circuit boards by the edges or hold onto grounded shields when possible.
7. Do not slide circuit boards over any surface.

## Install software upgrade



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**CAUTION.** *To prevent upgrade failure, your instrument must have the latest version of software installed before you install the hardware upgrade and before you install the software option key.*

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### Before You begin

You do not need to perform the software upgrade if your instrument has the latest version of software installed. Perform the following steps to determine if the software on your instrument needs to be upgraded:

1. Power on the instrument.
2. Verify the current software version installed on the instrument:
  - a. Press the **CONFIG** button on the front panel.
  - b. Navigate to **Utilities > View HW/SW Version**.
  - c. In the Hardware and Software Versions display window, note the software version number of the instrument.

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<b>Instrument Software version number</b>	
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3. Verify the latest version of software at the Tektronix Web site:
  - a. Use the Web browser on a PC to navigate to the following Tektronix Web site:  
<http://www.tektronix.com/downloads>
  - b. On the Downloads Finder Web page, search by model number (such as WVR8300) and filter by software and software type to locate the software-upgrade package for the instrument.
  - c. Note the latest version number of the software-upgrade package(s).

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<b>Web site Software version number</b>	
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4. If the latest software version at the Web site is newer than the version on your instrument, you need to upgrade the software.
5. Download the latest version to your PC.

6. After the software package is downloaded, click on the self-extracting archive to extract the following files into the directory of your choice: transfer.exe and firmware.pkg. There may also be a readme.txt file. To perform the upgrade, you can use either the USB Software Installation procedure or the Network Software Installation procedure. The time required to complete the upgrade is about 25 minutes.



**CAUTION.** *Once the instrument has started to erase internal flash, DO NOT remove power from the instrument. If you do so, the instrument flash will be corrupted. The instrument will have to be sent to a Tektronix factory service center to have the system software restored.*

**NOTE.** *If power to the instrument is lost before it begins erasing the internal flash, you can restart the software upgrade after the instrument reboots.*

*The first time an instrument is upgraded to software version 3.X, the upgrade process must be run two times.*

## USB software installation

Use the following steps to upgrade the instrument software using a USB memory device.

1. Insert the USB memory device into a USB port (of the PC containing the latest software).
2. On the PC, navigate to the USB device.
3. On the USB device, create a directory named:  
wfmUpgrd
4. Open the WfmUpgrd directory and copy the firmware.pkg file (from the extracted archive) to the USB device.  
  
You should have a directory path wfmUpgrd\firmware.pkg.
5. Safely remove the USB device from the PC and insert it into the USB port on the front panel of the instrument.
6. Power on the instrument.
7. Press the **CONFIG** front panel button.
8. Navigate to **Utilities > System Upgrade > Upgrade Options > USB Upgrade**.

**NOTE.** *If the instrument displays a message indicating that a USB device containing firmware was not detected, make sure you have the correct directory path on the USB device. Also, press the **MAIN** front panel button to check that the USB device is properly mounted.*

9. Press the **SEL** front panel button. This displays the System Software Upgrade window.
10. Select **Continue** from the System Software Upgrade window and press **SEL** to start the software upgrade.



**CAUTION.** *During the upgrade process, the instrument displays messages indicating the upgrade status. Do not remove the USB device until the upgrade is complete.*

---

11. If this is the first time that the instrument is being upgraded to 3.X, a message will appear stating that the software upgrade requires a second pass. Press **SEL** to continue.
12. If you saw the message stating that the upgrade requires a second pass, repeat steps 7 through 10.

### Network software installation

Use the following steps to upgrade the instrument software using a network connection.

1. Connect the instrument and PC to your local Ethernet network.
2. Power on the instrument.
3. Assign the instrument an IP address:

---

**NOTE.** *The data-transfer utility requires that the instrument be assigned a valid IP address. To allow network access to the instrument, the instrument must be assigned a valid IP address for your network. Network addresses can be assigned either manually or automatically using DHCP. If your network does not use DHCP, you will have to manually enter the address for the instrument. To get a valid IP address, contact your local LAN administrator.*

*Alternatively, if you connect the PC directly to the instrument using an Ethernet cable, you can assign the instrument any IP address that is compatible with the IP address of the PC.*

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- a. Press the **CONFIG** button on the front panel.
- b. Navigate to **Network Settings > IP Config Mode**.
- c. Select either **Manual** or **DHCP** as directed by your LAN administrator. Select **Manual** if you are using an Ethernet cable to connect the PC directly to the instrument.

- d. If you selected Manual mode, enter the IP address, subnet mask, and gateway address as directed by your LAN administrator. You need to enter only an IP address if you are using an Ethernet cable to connect the PC directly to the instrument.

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**NOTE.** *If you selected DHCP mode, the network automatically assigns the instrument an IP address.*

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- e. Press the **CONFIG** button on the front panel to close the menus.
4. Prepare the instrument for the software upgrade:
    - a. Press the **CONFIG** front panel button.
    - b. Navigate to **Utilities > System Upgrade > Upgrade Options > Network Upgrade**.
    - c. Press the **SEL** front panel button. Note the IP address of the instrument displayed in the System Software Upgrade window.
  5. Perform the software upgrade:
    - a. On the PC, double-click the **transfer.exe** file to launch the transfer program.
    - b. Type the IP address or DNS name of the instrument you are upgrading, and then press **Enter**. This starts the software upgrade process.



**CAUTION.** *To prevent upgrade failure, do not close the transfer.exe window until the transfer utility asks for another IP address.*

*When the software upgrade completes, the instrument may reboot.*

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- c. The transfer utility displays done when the software upgrade completes. When the software upgrade completes, the instrument will reboot.

```
Please enter DNS name or address of target instrument:
128.181.221.2
Opened TCP connection to 128.181.221.2:77
Reading Firmware Data... done
Erasing Flash... done
Programming Flash... done
Verifying Flash Programming... done
done

Please enter DNS name or address of target instrument:
-
```

**Figure 1: Sample of transfer.exe window after the upgrade is complete**

- 6. If the instrument did not reboot at the completion of the software upgrade, remove and then reapply power to the instrument to cause it to reboot.
- 7. If this is the first time that the instrument is being upgraded to 3.X, a message will appear stating that the software upgrade requires a second pass. Press **SEL** to continue.
- 8. If you saw the message stating that the upgrade requires a second pass, repeat steps 3 through 6.

## Install the option hardware

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 **WARNING.** Before installing any hardware option, disconnect the power cord from the line voltage source. Failure to do so could cause serious injury or death.

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 **CAUTION.** To prevent upgrade failure, your instrument must have the latest version of software installed before you install the hardware upgrade. (See page 14, *Install software upgrade.*)

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The procedures in this section are for upgrades that require the removal of the instrument top cover to install the hardware module or modules. For software-only upgrades, you do not need to remove the instrument cover since these upgrades are enabled by the new software key you received with this kit. (See page 35, *Install the option software key.*)

## Instrument cover removal



**WARNING.** *Disconnect the power source from the instrument before beginning this or any procedure requiring you to remove the cover from the instrument chassis. Failure to do so could cause serious injury or death.*

1. Arrange access to the top of the instrument (remove from rack as needed).
2. Remove the 18 T-10 screws that secure the cabinet top cover to its chassis and lift the cover off. Save the screws for reinstallation.

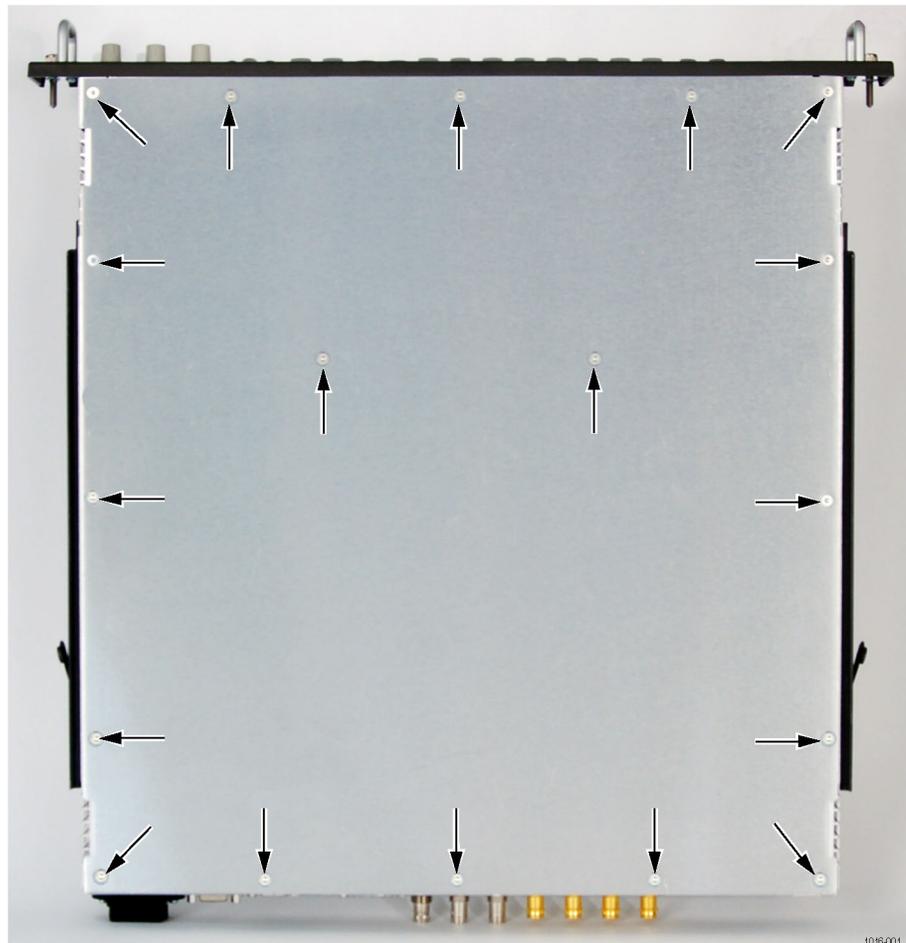


Figure 2: Top cover removal

**Hardware installation**  
**WVR820UP EYE**  
**WVR830UP PHY**  
**WVR720UP PHY3**

For Option EYE or Option PHY or PHY3 upgrades, perform the following steps to install the option into the instrument. Read the entire installation procedure before installing the module.

---

**NOTE.** *Option EYE and Option PHY or PHY3 occupy the same location in the instrument. If your instrument already contains an Option EYE or PHY or PHY3, it must be removed.*

*If removing an option module is necessary, you can reinstall the removed option module if you require its functionality.*

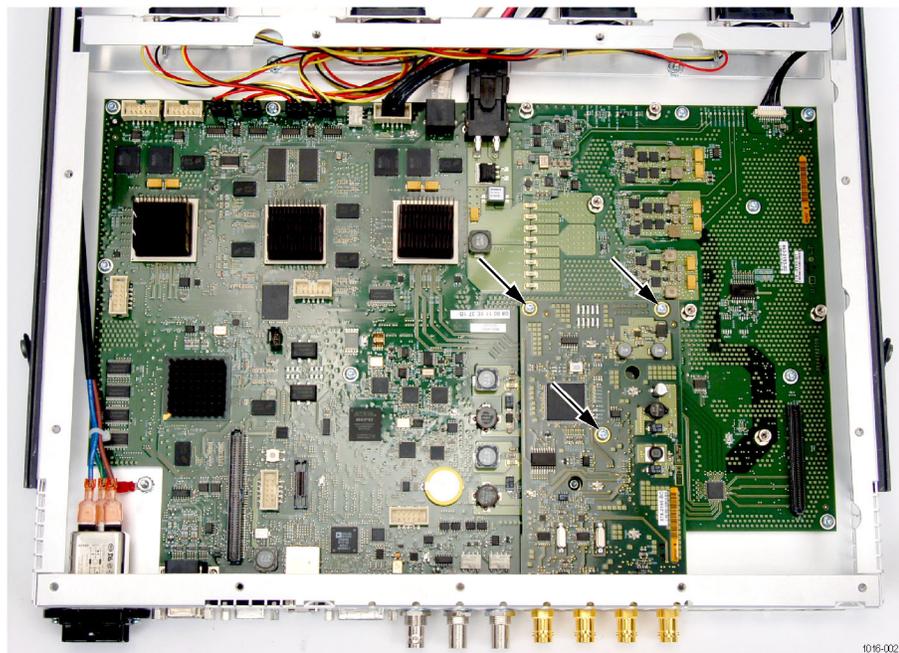
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1. Inspect the instrument for the presence of an Audio board option. (See Figure 18 on page 34.)

If an Audio board is installed, you need to temporarily remove it. (See page 33, *Audio board removal*.)

2. Remove the existing video board from the instrument. This could be the standard SDI video board, or a previously installed Option EYE or Option PHY or PHY3 video board.

Remove the retaining screws securing the video board to the main board. If removing an SDI video board, there are three screws to remove. (See Figure 9 on page 27.) If removing an existing EYE or PHY/PHY3 option video board, there are six screws to remove. (See Figure 4.)



**Figure 3: SDI board**

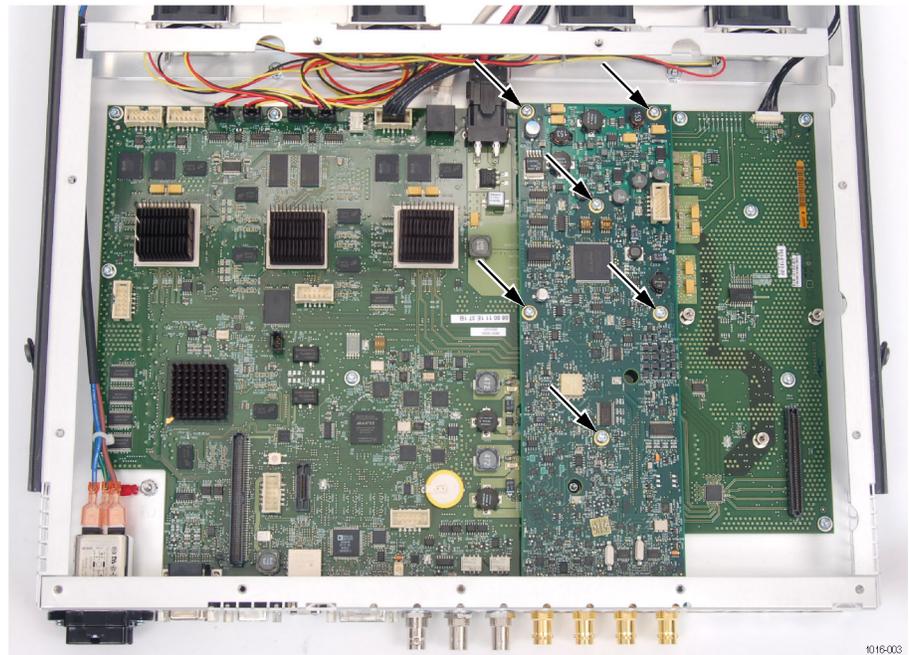


Figure 4: Option EYE or PHY/PHY3 board

3. Remove the four nuts and lock washers securing the BNC connectors SDI A IN, SDI A OUT, SDI B IN SDI B/CLOCK OUT.
4. If an audio board was present, there will be a post protruding through the video board. Temporarily remove the post and save it for reinstallation. (See Figure 5.)



Figure 5: Audio post through video board



**CAUTION.** Do not flex or bend the circuit boards when removing or installing.

---

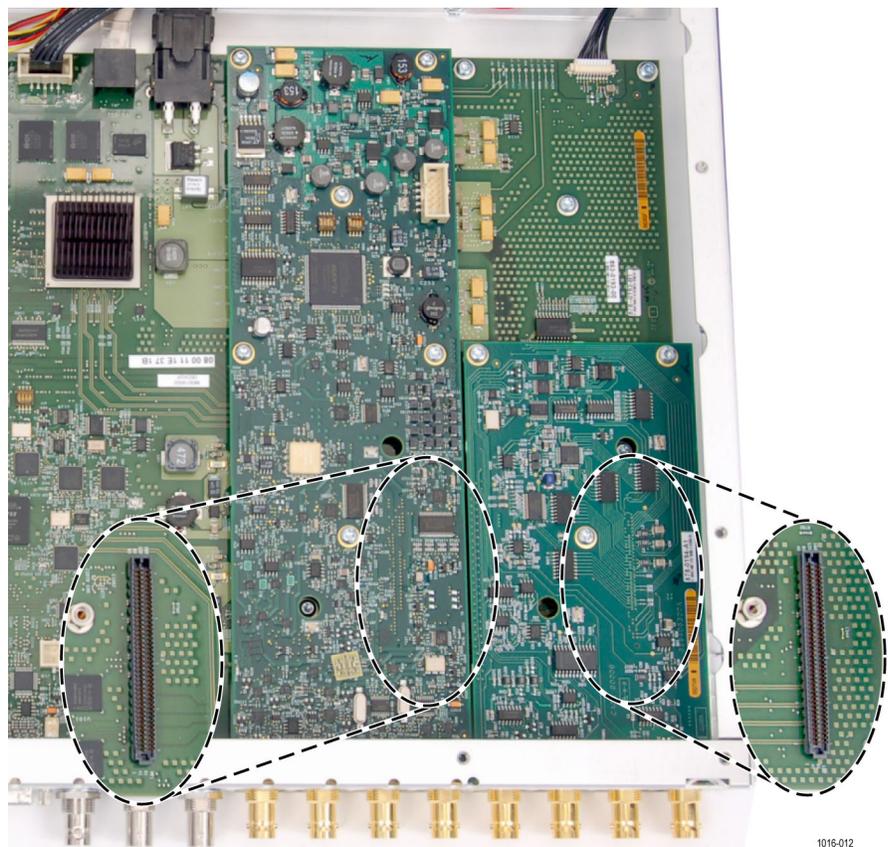
5. Grasp the video card near the location of the connector that is located beneath the video board. Gently lift the existing video board up at a slight angle to disengage the connector underneath the video board, and out of the instrument.

6. Install the Option EYE or Option PHY or PHY3 video board into the instrument.
  - a. Line up the BNC connectors to the holes in the rear panel and slide the board into the mainframe until BNC connectors fully protrude through the rear panel.



**CAUTION.** Do not flex or bend the circuit board when installing.

- b. Make sure the connector on the bottom of the video board and main board line up. Pressing only over the location of the connector, gently press the video board down until the connectors engage. (See Figure 8 on page 26.) The video board should sit firmly on all six posts.



**Figure 6:** Video board connector location



**Hardware installation**  
**WVR820UP 2SDI**  
**WVR830UP 2SDI**  
**WVR720UP 2SDI**

For Option 2SDI upgrades, perform the following steps to install the Option 2SDI module into the instrument. Read the entire installation procedure before installing the module.

---

**NOTE.** *Option CPS and Option 2SDI occupy the same location in the instrument. If your instrument already contains an Option CPS board, it must be removed.*

*If removing an option module is necessary, you can reinstall the removed option module if you require its functionality.*

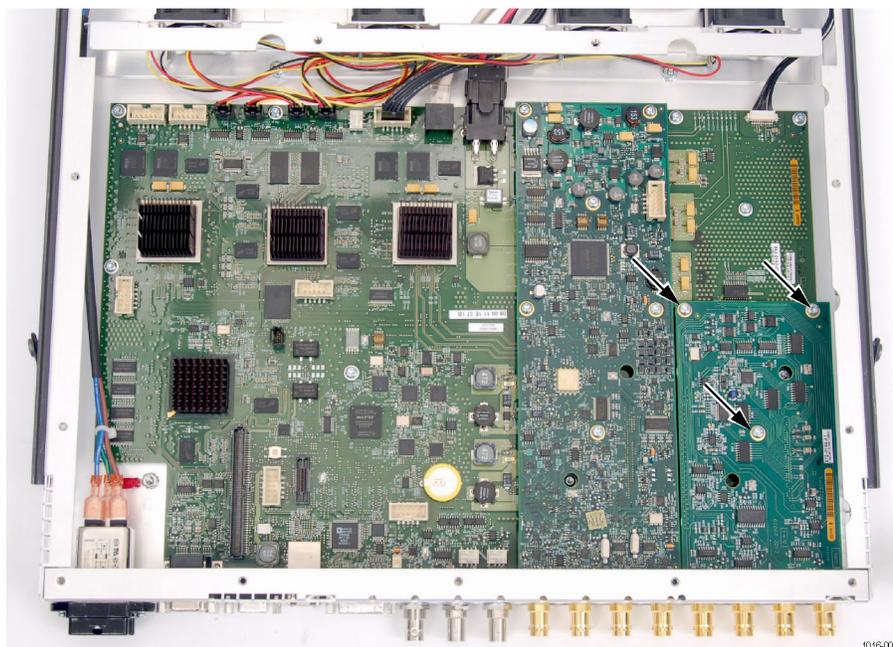
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1. Inspect the instrument for the presence of an Audio board option. (See Figure 18 on page 34.)

If an Audio board is installed, you need to temporarily remove it. (See page 33, *Audio board removal*.)

2. If a Composite board is present in Slot 2, remove it from the instrument.

Remove the retaining screws securing the composite board to the main board. There are three screws to remove. (See Figure 7.)



**Figure 7: Option CPS board**

3. Remove the four nuts and lock washers securing the BNC connectors CMPST A LOOP-THROUGH and CMPST B LOOP-THROUGH.



**CAUTION.** *Do not flex or bend the circuit boards when removing.*

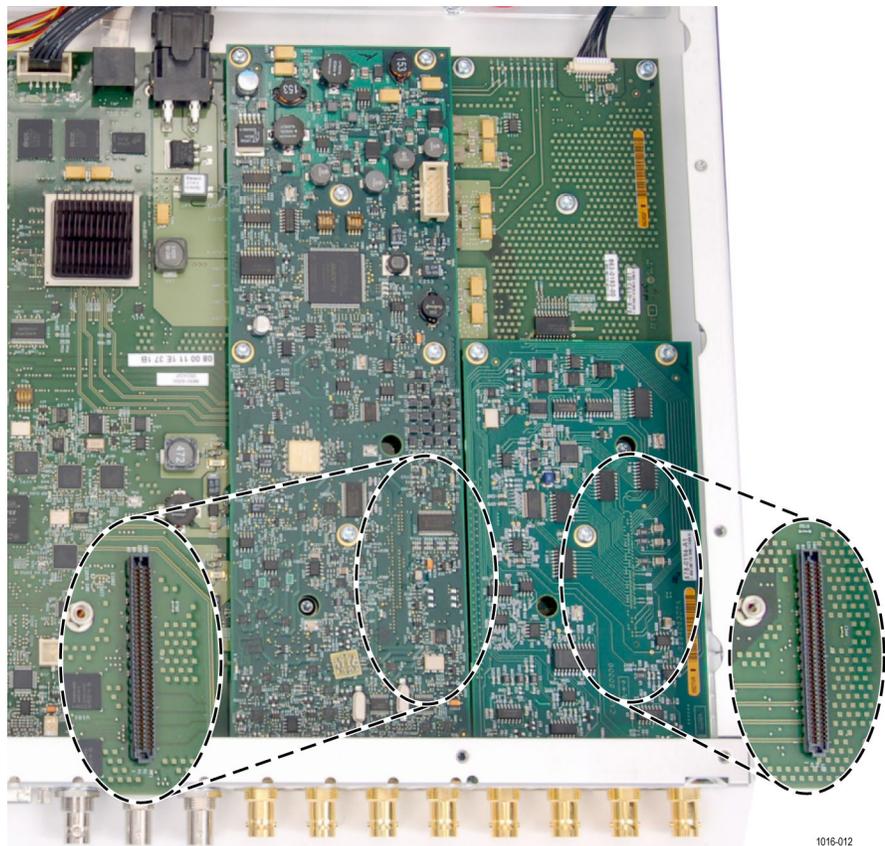
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4. Grasp the Composite board near the location of the connector that is located beneath the Composite board. Gently lift the board up at a slight angle to disengage the connector underneath the board and out of the instrument.
5. Install the Option 2SDI video board into the instrument.
  - a. Line up the BNC connectors to the holes in the rear panel and slide the board into the mainframe until BNC connectors fully protrude through the rear panel.



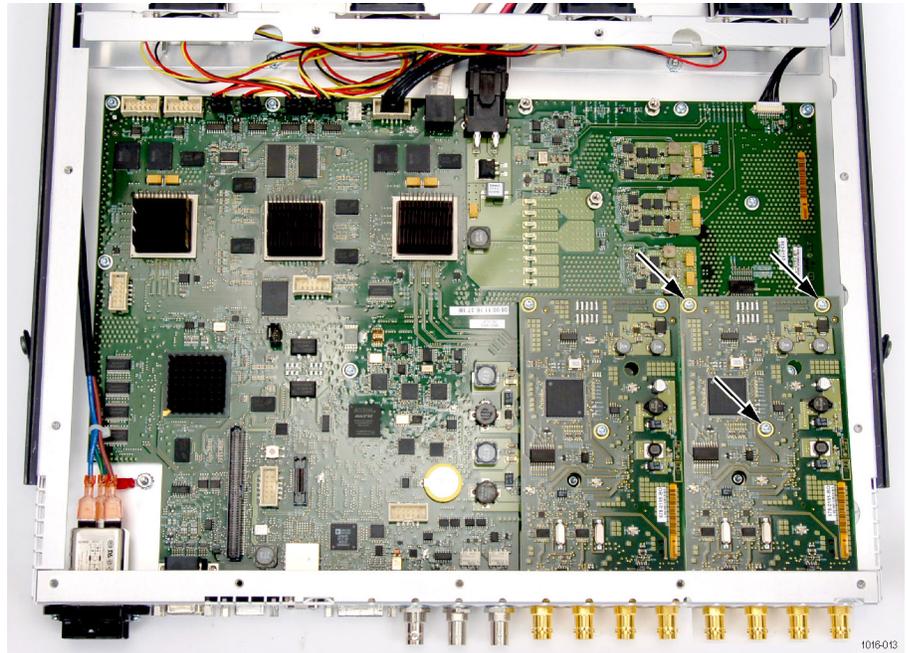
**CAUTION.** Do not flex or bend the circuit board when installing.

- b. Make sure the connector on the bottom of the SDI board and main board line up. Pressing only over the location of the connector, gently press the SDI board down until the connectors engage. (See Figure 8.) The SDI board should sit firmly on all six posts.



**Figure 8:** SDI board connector location

- c. Secure the SDI board to the three mounting posts with the three T-15 screws from the kit. Tighten firmly, but not excessively. (See Figure 9.)



**Figure 9: SDI board screws**

- e. Secure the four BNC connectors using the four lock washers and BNC nuts from the kit.
  - f. Attach the new SDI label below the BNC connectors. If needed, remove the previous label.
  - g. Reinstall the post for the audio board if one was removed. (See Figure 5 on page 22.)
6. Perform the following steps if you do not have any other hardware modules to install. Otherwise, proceed to installing the next module.
    - a. Secure the cabinet top cover to its chassis with the 18 T-10 screws previously removed.
    - b. Install the option software key. (See page 35, *Install the option software key.*)

---

**NOTE.** Once the hardware is installed, you must download the software to activate Option 2SDI. Go to [www.tektronix.com/downloads](http://www.tektronix.com/downloads). (See page 14, *Install software upgrade.*)

---

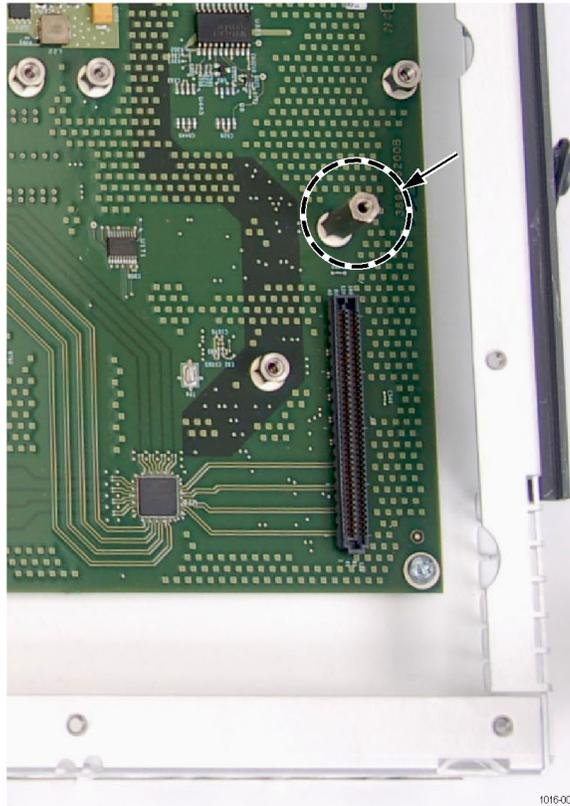
**Hardware installation**  
**WVR820UP CPS**  
**WVR830UP CPS**  
**WVR720UP CPS**

For Option CPS upgrades, perform the following steps to install the Option CPS module into the instrument. Read the entire installation procedure before installing the module.

1. Inspect the instrument for the presence of an Audio board option. (See Figure 18 on page 34.)

If an Audio board is installed, you need to temporarily remove it. (See page 33, *Audio board removal*.)

2. If an audio board was present, temporarily remove the post from where the Option CPS board installs. Save the post for reinstallation. (See Figure 10.)



**Figure 10: Audio post in CPS board location**

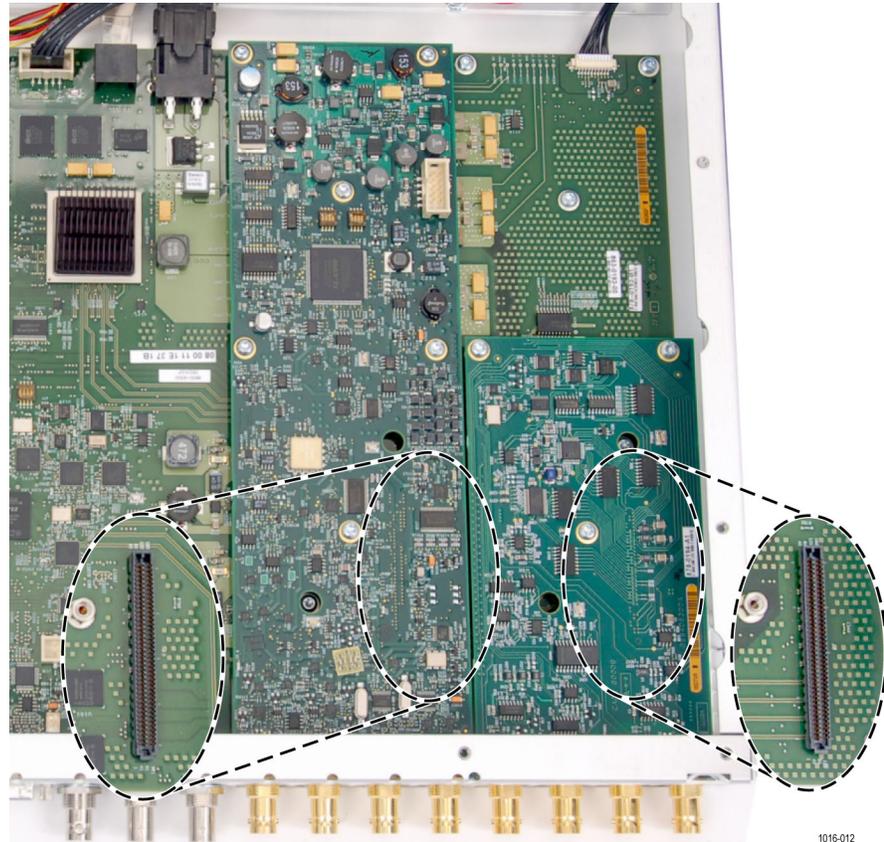
3. Remove the four plugs from holes on the lower right-hand corner on the rear of the instrument.
4. Line up the BNC connectors on the CPS board to the holes in the rear panel and slide the board into the mainframe until BNC connectors fully protrude through the rear panel.



**CAUTION.** *Do not flex or bend the circuit board when installing.*

---

5. Make sure the connector on the bottom of the CPS board and main board line up. (See Figure 11.) Pressing only over the location of the connector, gently press the CPS board down until the connectors engage. The CPS board should sit firmly on all three posts.



1016-012

**Figure 11: CPS board connector location**

6. Secure the CPS board to the three mounting posts with the three T-15 screws from the kit. Tighten firmly, but not excessively. (See Figure 7 on page 25.)
7. Secure the four BNC connectors using the four lock washers and BNC nuts from the kit.
8. Attach the new CMPST label below the BNC connectors.

9. Reinstall the post for the audio board the audio board if removed.
10. Perform the following steps if you do not have any other hardware modules to install. Otherwise, proceed to installing the next module.
  - a. Secure the cabinet top cover to its chassis with the 18 T-10 screws previously removed.
  - b. Install the option software key. (See page 35, *Install the option software key.*)

**Hardware installation**  
**WVR820UP AD**  
**WVR830UP AD**  
**WVR720UP AD**  
**WVR820UP DPE**  
**WVR830UP DPE**  
**WVR720UP DPE**

For the Option AD or Option DPE audio upgrades, perform the following steps to install the audio board into the instrument. Read the entire installation procedure before installing the module.

---

**NOTE.** *Option AD or Option DPE should be the last hardware option installed. If you need to install any other hardware options, install those first, then install Option AD or Option DPE.*

---

*Option AD and Option DPE occupy the same location in the instrument. If your instrument already contains an Option AD or Option DPE, it must be removed.*

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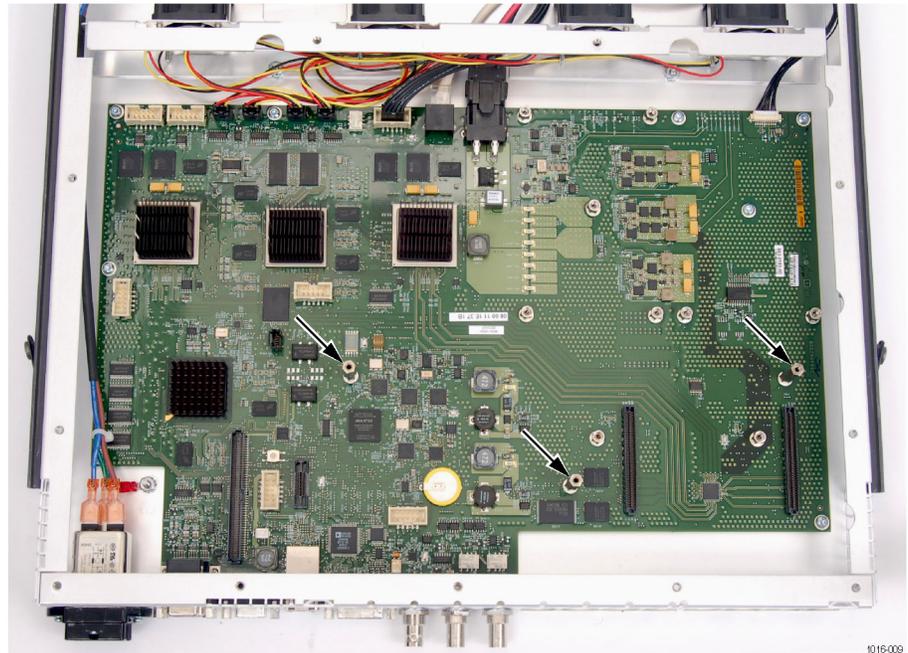
1. Inspect the instrument for the presence of an Audio board option. (See Figure 18 on page 34.)

If an Audio board is installed, you need to remove it. (See page 33, *Audio board removal.*). Otherwise, continue with this procedure.
2. Remove the eight plugs from the AES holes on the rear of the instrument.
3. Remove the two screws that secure the blank cover from the Analog Audio I/O hole.(See Figure 12.)



**Figure 12: Remove blank cover for audio connector**

4. Replace three main board mounting screws with the three posts from this kit as illustrated. If an audio board was installed previously, you can leave the three existing posts installed. (See Figure 13.)



**Figure 13: Audio board post locations**

5. Line up the BNC connectors to the holes in the rear panel and slide the audio board into the mainframe until BNC connectors fully protrude through the rear panel.
6. The audio board should sit firmly on all three posts.

7. Secure the audio board to the three mounting posts with the three T-15 screws from the kit. Tighten firmly, but not excessively. (See Figure 14.)

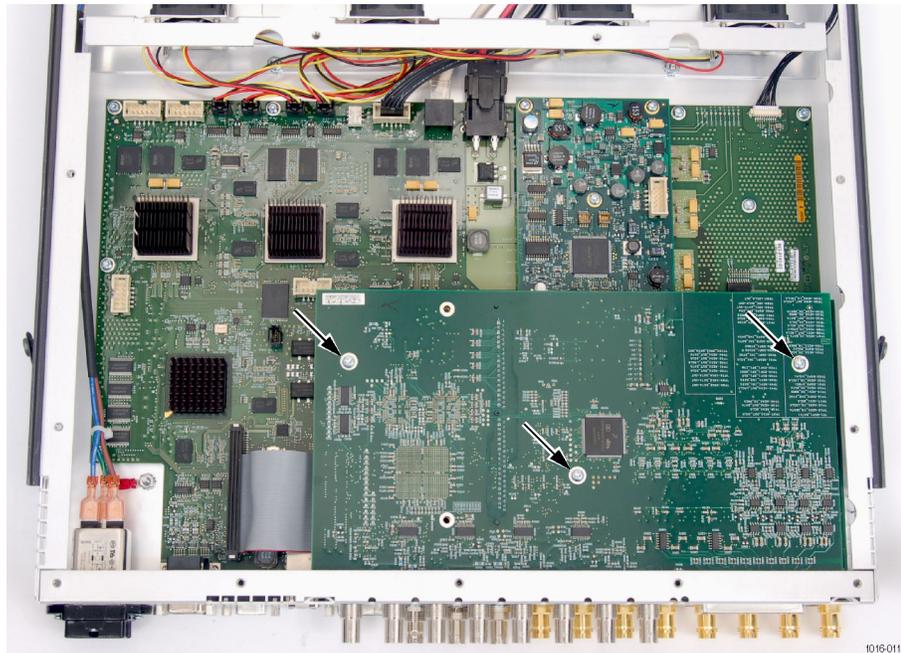


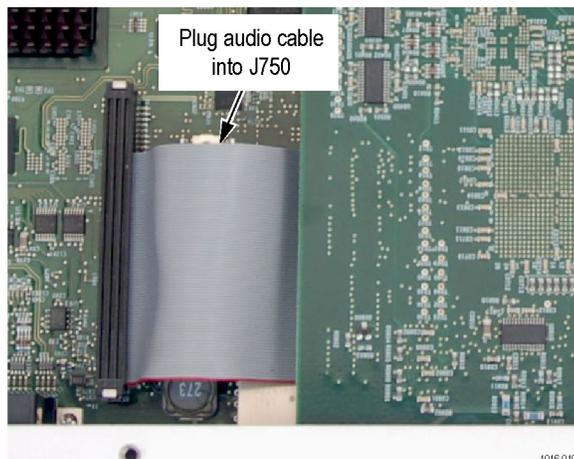
Figure 14: Audio board screws

8. Secure the eight BNC connectors using the eight lock washers and BNC nuts from the kit.
9. Use a 3/16 in. nut driver to install the two retainer posts from this kit to secure audio connector to the rear panel. (See Figure 15.)



Figure 15: Audio connector retainer posts

10. Plug the audio cable into connector J750. (See Figure 16.)



**Figure 16: Audio cable**

11. Secure the cabinet top cover to its chassis with the 18 T-10 screws previously removed.
12. Install the option software key. (See page 35, *Install the option software key.*)

---

**NOTE.** Use the supplied 62-pin DSUB connector to attach analog-audio signals to the instrument. Solder wires to the connector as needed to accommodate the desired audio inputs and outputs. Refer to the Safety and Installation Instructions for the connector pin assignments.

Audio signals can be connected as either balanced or unbalanced. Be sure to use a suitable cable when you are wiring balanced audio. An example of a suitable cable is Belden 8451, which is a shielded twisted pair cable.

Alternatively, you can purchase an audio breakout cable (Tektronix part number 012-1688-00), which provides a two meter cable with XLR connectors for all twelve inputs and eight outputs.

---

### Audio board removal

The optional audio circuit board installs above other optional hardware upgrade circuit boards so you might need to temporarily remove it to install other upgrades. You will reinstall the audio circuit board unless it is being replaced by Option DPE.

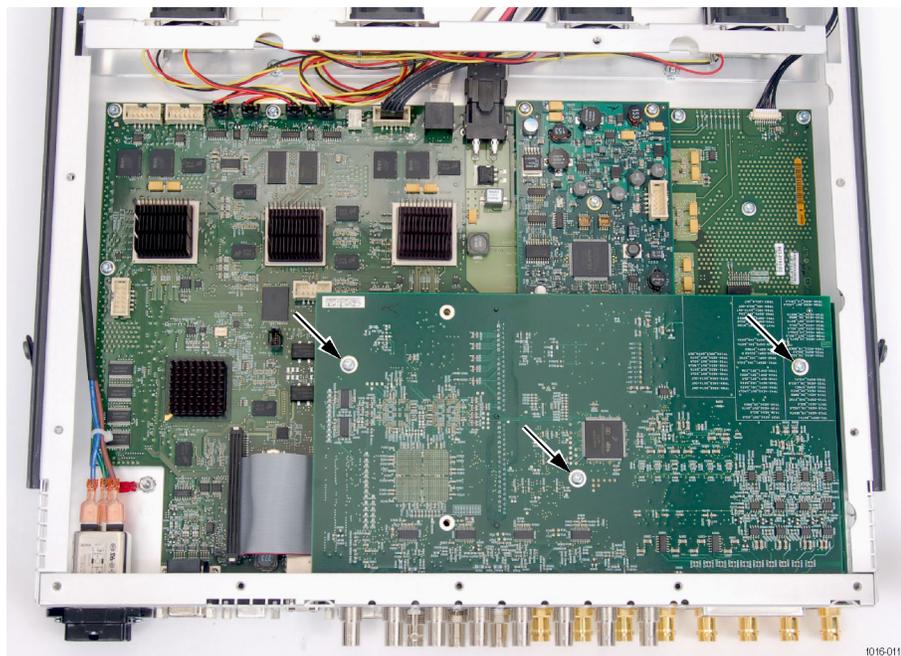
Perform these steps to remove the audio circuit board.

1. Remove the 5/16 inch nut and washers that secure the eight audio BNC connectors (AES1-2 In through AES 7-8 In and AES 1-2 I/O through AES 7-8 I/O) to the rear panel.
2. Remove the two 3/16 inch retainer posts that secure audio connector to the rear panel. (See Figure 17.)



**Figure 17: Audio connector**

3. Unplug the audio cable from J750.
4. Remove the three T-15 screws securing the audio board. (See Figure 18.)
5. Lift the audio board out of the instrument and store it in a static safe location.
6. Return to your original installation procedure.



**Figure 18: Audio board installed**

## Install the option software key

Read the entire procedure before installing the software option key.



---

**CAUTION.** *To prevent upgrade failure, your instrument must have the latest version of software installed before installing the hardware upgrade and before installing the option key. (See page 14, Install software upgrade.)*

---

1. Verify that the instrument is powered on and connected to your local network.
2. Verify the IP address of the instrument:
  - a. Press the **CONFIG** button on the front panel.
  - b. Navigate to **Utilities > Communications > Network Setup**.
  - c. Note the IP address of the instrument.
  - d. If the instrument does not have an IP address set, ask your network administrator for a valid IP address. Refer to the online help or the User manual on how to set the instrument IP address.
3. Verify that you have access to a PC with a Web browser application that is connected to a network with access to the instrument.
4. Perform the following steps to enter the software option key:
  - a. On the PC, open your Web browser application.
  - b. In the address bar of the Web browser, enter the IP address of the instrument you are upgrading. This opens the **Tektronix WVR8200/WVR8300 Remote Interface** screen.
  - c. Click the **Instrument Options** link to open the **Active WVR8200/8300 Options** screen.
  - d. In the **Key** field, enter the 20-character option key string (with or without dashes). The new option key is supplied in the Important Documents envelope.
  - e. Click the **Submit** button to enable the software option. The instrument enables the option and adds the installed option to the list of currently installed options shown at the top of the screen.

---

**NOTE.** *If you purchased multiple options, the software option key supplied with this kit activates all of the options you purchased.*

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## Verify the upgrade

### Quick verification

Perform the following procedure to verify that the new option(s) have been installed and the instrument is functioning correctly:

1. Power on the instrument.
2. Verify the installed options by performing the following steps:
  - a. Press the **CONFIG** button on the front panel.
  - b. Navigate to **Utilities > View Instrument Options** to display the installed options.
  - c. Verify that the options installed prior to this upgrade are still enabled, and that the new option(s) you installed are enabled.

---

**NOTE.** *If the option(s) you just installed are not listed or if your previously installed options are not listed, contact Tektronix for assistance.*

---

3. Verify that the instrument passes the advanced diagnostic tests by performing the following steps:
  - a. In the Config menu, navigate to **Utilities > Run Diagnostics**.
  - b. Press the **SEL** button.
  - c. Press the right arrow key to highlight the box next to **Run Advanced Diagnostics**. This box is located at the bottom of the display screen.
  - d. Verify that for each diagnostic test the result reads **Pass**.
  - e. When the test is complete, press the right arrow key to highlight the box next to **Exit** to exit the diagnostics display.
  - f. If you want to view the diagnostics test results again, select **View Diagnostic Log** from the **Utilities** menu.

---

**NOTE.** *If a diagnostic test fails, contact Tektronix for assistance.*

---

### Detailed verification

If you want to perform additional verification of the installed options, perform the *Incoming Inspection Tests* found in the Specifications and Performance Verification manual using the specified test equipment.